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(54) **Floor nozzle of a vacuum cleaner.**

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention generally relates to a vacuum cleaner used in an ordinary household, and more particularly, to a floor nozzle of the vacuum cleaner.

Description of the Prior Art

Japanese Patent Publication No. 59-52548 discloses a floor nozzle of a vacuum cleaner for raking up dust or waste thread on a carpet, a hard floor made of wood or the like to draw it into a dust bag accommodated in a cleaner body.

Japanese Patent Publication No. 52-6036 discloses another floor nozzle of the vacuum cleaner.

These prior arts are shown in Figs. 1 and 2.

The floor nozzle shown in Fig. 1 is provided with an intake opening 2 formed on a lower side of a nozzle body 1 and a plurality of brushes 3 disposed in front of and behind the intake opening 2 for raking up dust on a floor. The brushes 3 are so held by respective holders 4 as to be adjustable in their vertical positions according to the kind of a surface to be cleaned. The nozzle body 1 is supported by a pair of rollers 6 and communicates a suction side of the cleaner body by way of an intake joint 5.

Fig. 2 depicts an attachment nozzle provided with a cylindrical rotor 8 inside and at a central portion of a nozzle body 7 and a pair of guide walls 9 each having a circular internal surface 9a spaced from the rotor 8 at a fixed interval. A great number of inclined short bristles 10 are formed on the entire external surface of the rotor 8 and on the entire internal surfaces of the paired guide walls 9a to rake up dust on a surface to be cleaned. Arrows shown in Fig. 2 indicate intake air flows.

When the vacuum cleaner having the conventional floor nozzle of Fig. 1 is used on a carpet, the brushes 3 are caused to move inwards so as not to be caught by the carpet or not to prevent the cleaner from smoothly moving on the carpet in order to raise the operability of the cleaner. Because of this, suction force of the cleaner, even with the slight raking by the brushes 3, can not sufficiently catch fibrous dust, for example, waste thread on the carpet, and therefore, the dust is frequently left on the carpet. Consequently, the vacuum cleaner of this kind can not show its ability to the full and is very insanitary, since the waste thread caught by the brushes 3 can not be drawn into the cleaner and is kept caught on the brushes 3.

In the example of Fig. 2, the bristles 10 of the rotor 8 are occasionally caught by the carpet according to the kind of the carpet or due to unevenness of force given by an operator. This fact imposes extremely increased force upon the operator for operating the nozzle. Accordingly, the operator sometimes feels it hard to control the vacuum cleaner with this attachment nozzle. This attachment nozzle is not serviceable in cleaning the hard floor, since the rotor 8 with the bristles 10 is disadvantageous in handling on the hard floor or hard particles such as sand or the like caught by the bristles 10 sometimes scratch the surface of the floor.

SUMMARY OF THE INVENTION

Accordingly, the present invention has been developed with a view to substantially eliminating the above described disadvantages inherent in the prior art floor nozzle of a vacuum cleaner, and has for its essential object to provide an improved floor nozzle capable of readily catching and drawing therein waste thread or the like irrespective of a surface to be cleaned.

Another important object of the present invention is to provide a floor nozzle capable of positively drawing therein relatively heavy particles such as sand or the like on a hard floor.

A further object of the present invention is to provide a floor nozzle which is easy in handling.

A still further object of the present invention is to provide a floor nozzle which is simplified in its maintenance.

In accomplishing these and other objects, the floor nozzle according to one preferred embodiment of the present invention is provided with an upper nozzle housing hingedly connected to an intake joint of the cleaner, a lower nozzle housing securely connected to the upper nozzle housing and defining an intake opening on its lower side, and a dust collector accommodated in the upper and lower nozzle housings.

A first air passage communicating between the intake opening and the intake joint is formed in the upper and lower nozzle housings and communicates a second air passage formed in the dust collector. A thread catcher and a scraper are accommodated in the dust collector. The thread catcher is rotatable in response to forward and rearward movement of the floor nozzle and capable of catch waste thread on a surface to be cleaned when the thread catcher rotates upon forward movement of the floor nozzle. The scraper is capable of removing the waste thread caught by the thread catcher when the thread catcher rotates upon rearward movement of the floor nozzle. A covering member is hingedly connected to the dust

collector for opening or closing the second air passage in response to a manual lever provided on the floor nozzle.

The thread catcher is provided with a great number of bristles on its circular surface located at a rear portion of the floor nozzle. When an operator pushes the cleaner, the thread catcher rotates so as to be accommodated in the dust collector. In this event, the bristles of the thread catcher never be brought into contact with the surface to be cleaned. In other words, when the cleaner is pushed, the bristles of the thread catcher which increases frictional resistance between it and the surface to be cleaned is retracted inside the floor nozzle. This fact results in lowered operation force and rendering the cleaner to be easy in handling.

Furthermore, to simplify nozzle maintenance, the thread catcher is detachably mounted in the dust collector. This is especially advantageous when the bristles of the thread catcher have almost worn due to long-term use of the floor nozzle or when the thread catcher will not rotate due to clogging of relatively large dust such as cotton dust or the like.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects and features of the present invention will become more apparent from the following description taken in conjunction with the preferred embodiment thereof with reference to the accompanying drawings, throughout which like parts are designated by like reference numerals, and in which:

Fig. 1 is a longitudinal sectional view of a conventional floor nozzle;

Fig. 2 is a view similar to Fig. 1, of another conventional floor nozzle;

Fig. 3 is a longitudinal sectional view of a floor nozzle according to one preferred embodiment of the present invention;

Fig. 4 is a top plan view of a dust collector provided in the floor nozzle of Fig. 3;

Fig. 5 is a section taken along the line V-V of Fig. 4;

Fig. 6 is a section taken along the line VI-VI of Fig. 4;

Fig. 7 is a section taken along the line VII-VII of Fig. 4, indicative of a state in which a rotor accommodated in the dust collector has rotated forwards;

Fig. 8 is a section taken along the line VIII-VIII of Fig. 4;

Fig. 9 is a top plan view of the floor nozzle with an upper nozzle housing being removed;

Fig. 10 is a perspective view of the floor nozzle of Fig. 3;

Fig. 11 is a bottom plan view of the floor nozzle

of Fig. 3; and

Fig. 12 is a fragmentary sectional view of a portion where the rotor is provided, indicative of a state in which the rotor is detachably mounted in a lower nozzle housing.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figs. 3 to 11 depict a floor nozzle according to one preferred embodiment of the present invention. A nozzle body 11 of the floor nozzle is primarily comprised of an upper nozzle housing 12 and a lower nozzle housing 13, both of which are securely connected through a bumper 14. A rear central portion of the nozzle body 11 is formed circularly to be hingedly connected with a substantially cylindrical portion of an intake joint 15. A pair of rollers 17 are disposed below and on respective sides of the intake joint 15, thereby rendering the floor nozzle to be readily movable. The lower nozzle housing 13 of the nozzle body 11 is provided with a dust intake portion 20 and a pair of slits 21 formed in front of and behind the dust intake portion 20 in parallel therewith. The dust intake portion 20 has an intake opening 18 at its central portion and two grooves 19 extending outwards from the intake opening 18 and having open outer ends.

The nozzle body 11 accommodates a pair of brushes 22 and brush regulators 23 adjacent to respective brushes 22 for moving them up and down. Each of the brushes 22 is of the construction in which a bundle of bristles 25 is securely held by a brush holder 24 and is free to move up and down, since a plurality of bosses 27 protruding from the upper nozzle housing 12 are loosely inserted into respective guide openings 26 formed at opposite ends of the brush holders 24, as shown in Fig. 9. Upon vertical movement, the brushes 22 can protrude downwards from the nozzle body 11 through the slits 21 or can retract inside it.

As shown in Fig. 10, the brush regulators 23 can be controlled by a lever 28 protruding outwards from a through-opening 29 formed in the upper nozzle housing 12. A dust or waste thread collector 30 accommodating a rotor 31 and a scraper plate 32 is provided behind the intake opening 18 and between a pair of rollers 17. The rotor 31 is provided with a great number of bristles 33 on its rear circular portion and a rubber piece 35 between its front and rear circular portions for rendering the rotor 31 to rotate in both directions. The rotor 31 together with the bristles 33 and the rubber piece 35 constitutes a thread catcher for catching waste thread, cotton dust or the like. The scraper plate 32 is provided also with a great number of bristles 34, which are orientated substantially in the same direction as those 33 of the

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rotor 31 are done. The scraper plate 32 is biased against the rotor 31 by a spring or the like.

An air passage 36 is defined by the upper nozzle housing 12 and a partition wall 37 formed between the intake opening 18 and the intake joint 15. On the dust collector 30 is provided a covering plate 38 which is pivotable about its pivot shaft 40 to open or close an opening 39 formed in an upper plate of the dust collector 30. Upon operation of the lever 28, the opening 39 of the dust collector 30 is opened or closed by the covering plate 38, since a cam 41 securely connected to the lever 28 engages with a cam plate 42 securely connected to the pivot shaft 40 of the covering plate 38 which is biased by a spring 43 in a direction in which the covering plate 38 is opened. Only when the lever 28 is so operated as to slide towards the central portion of the nozzle body 11, the opening 39 of the dust collector 30 is opened so that the dust collector 30 may communicate the air passage 36 through the opening 39.

The pivot shaft 40 of the covering plate 38 has one end 40a extending through an opening 45 formed in the dust collector 30 and the other end 40b connected to the dust collector 30 by way of the spring 43 so that the pivot shaft 40 may not be readily detached from the dust collector 30 by virtue of a bent end portion 43a of the spring 43. The dust collector 30 is provided with a projection 30a integrally formed therewith and protruding downwards therefrom towards the rotor 31. The projection 30a is encircled by a shock absorber 46. Upon rotation of the rotor 31 in a direction in which the rubber piece 35 moves frontwards, an end of the front circular portion thereof is brought into contact with the shock absorber 46, thereby lightening collision between these two members. The radius of the rear circular portion of the rotor 31 is greater than that of the front circular portion so that the bristles 33 of the rear circular portion may be brought into contact with those 34 of the scraper plate 32 whereas the front circular portion may not.

In operation, the bristles 25 of the brushes 22 are regulated in their protruding length according to the state of a surface to be cleaned. For example, when the surface to be cleaned is a carpet, the brushes 22 are in their completely retracting state. When the operator requires relatively weak suction force, the brushes 22 are caused to maximize their protruding length. When the operator requires strong suction force to clean a hard floor, the brushes 22 are caused to be in a state between their retracting state and maximum protruding state. The protruding length of the brushes 22 is regulated by sliding the brush regulators 23 on either side using the lever 28, resulting in vertical movement of the brushes 22 along cam grooves (not shown). Dust on the hard floor is drawn into

the nozzle body 11 through the intake opening 18 and the intake grooves 19 extending outwards therefrom. The dust is then drawn into the cleaner body through the intake joint 15.

When the carpet is cleaned, the lever 28 is set on the central side of the nozzle body 11 to completely retract the brushes 22 inside the nozzle body 11. In this event, the covering plate 38 opens a rear portion of the opening 39 of the dust collector 30 so that the dust collector 30 may communicate the air passage 36. Accordingly, the suction force from the cleaner body smoothly acts upon fibrous dust such as waste thread or the like caught in the dust collector 30. Thus, the dust is caused to effectively rush out of the dust collector 30 into the air passage 36. Furthermore, since the opening 39 of the dust collector 30 is opened at its rear portion, intake air drawn into the intake opening 18 can form a smooth air flow in the air passage 36, rendering a noise produced by collision of the intake air or a noise of the air flow to be reduced.

When the operator pulls the nozzle body 11, the rubber piece 35 of the rotor 31 is caught by the carpet and moves frontwards. Consequently, as shown in Fig. 7, the bristles 33 of the rotor 31 are brought into contact with the surface to be cleaned to catch the waste thread. When the operator pushes the nozzle body 11, the rotor 31 rotates rearwards so that the bristles 33 thereof confront those 34 of the scraper plate 32. Thereafter, when the operator pulls the nozzle body 11 again, the rotor 31 rotates frontwards so that the bristles 33 thereof confront the surface to be cleaned. In this event, the waste thread is raked up by the bristles 34 of the scraper plate 32 and hardly remains on the bristles 33 of the rotor 31. In this way, the rotor 31 is kept in a clean state at all times, rendering the nozzle body 11 to show its ability to the full.

The waste thread raked up by the bristles 34 are rapidly drawn into the air passage 36 by virtue of the suction force of the cleaner body. Accordingly, little of the dust accumulated in the dust collector 30 will remain therein.

In particular, since the dust collector 30 is provided between a pair of rollers 17, the bristles 33 of the rotor 31 hardly be caught by the carpet more than necessary when the carpet is cleaned. This fact is conducive to improved operability of the cleaner and renders the dust on the carpet to be readily removed. When the hard floor is cleaned, the bristles 33 of the rotor 31 never be brought into contact with the floor, since the nozzle body 11 is securely supported by the rollers 17. As a result, sand or other hard particles are neither caught by the bristles 33 nor damage the floor. The cleaner having such a nozzle body 11, therefore, can be used with superior operability.

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Moreover, the shock absorber 46 encircling the projection 30a of the dust collector 30 lightens the collision of the front circular portion of the rotor 31 against it which occurs upon rotation of the rotor 31. Accordingly, not only little abnormal noise is produced by such the collision, but also the operator feels little shock in handling the cleaner.

In addition, since the front circular portion of the rotor 31 is smaller in radius than the rear circular portion thereof, the entire rotor 31 can be formed into a compact size, thus greatly contributing to the miniaturization of the nozzle body 11.

In assembling the nozzle body 11, the rotor 31, the scraper plate 32 and the like are initially accommodated in the dust collector 30 with the covering plate 38 being securely held on the opening 39 of the dust collector 30. Several portions which require accurate dimension for proper dust collecting operation of the cleaner are formed into one or more units, resulting in an effectively improved design and rendering the floor nozzle to be readily formed into a desired air-tight construction.

Hereupon, although the amount of intake air drawn into the intake opening 18 reduces when the covering plate 38 opens the opening 39 of the dust collector 30, a relatively small quantity of air which hardly exert any influence upon the dust collecting performance of the cleaner is enough for flowing dust out of the dust collector 30. The dust collector 30 can raise the performance of the cleaner in collecting waste thread or the like and is conducive to a reliable and remarkably easy-to-use cleaner which is superior in operability not only on a carpet but on a hard floor.

Fig. 12 depicts a state in which the rotor 31 is detachably mounted in the lower nozzle housing 13. A pair of concave bearing portions 52 are formed in the lower nozzle housing 13 on respect sides thereof. The rotor 31 is provided with a boss 56 integrally formed therewith on one side thereof and a circularly hollowed wall 58 formed on the other side thereof for receiving a rotary shaft 57. The boss 56 and the rotary shaft 57 inserted into the hollowed wall 58 engage with respective bearing portions 52 for rotation of the rotor 31 about them. The rotary shaft 57 is biased against the corresponding bearing portion 52 by means of a compression spring 59 accommodated in a space defined by the hollowed wall 58 and the rotary shaft 57. A hook 60 is integrally formed with the rotary shaft 57 and extends through a hole formed in the hollowed wall 58 to prevent the rotary shaft 57 from slipping off.

If the rotor 31 having the above described construction is caused to slide in a direction shown by an arrow (a) by holding the rubber piece 35, the boss 56 of the rotor 31 is off the corresponding bearing portion 52. In this event, when the rotor 31

is caused to move in a direction shown by an arrow (b), it can be readily taken away from the lower nozzle housing 13.

Accordingly, when the bristles 33 of the rotor 31 have almost worn or when cotton dust or the like has undesirably entered a gap between the rotor 31 and the scraper plate 32, the rotor 31 can be readily dismounted from and mounted in the lower nozzle housing 13 without any special tool, thus resulting in simplified nozzle maintenance.

As is clear from the above, the floor nozzle according to the present invention can positively catch waste thread or any other dust to draw it thereinto irrespective of a surface to be cleaned. In addition, the floor nozzle of the present invention is superior in operability and easy in assembling, and of a construction to simplify its maintenance.

Although the present invention has been fully described by way of examples with reference to the accompanying drawings, it is to be noted here that various changes and modifications will be apparent to those skilled in the art. Therefore, unless such changes and modifications otherwise depart from the scope of the present invention, they should be construed as being included therein.

Claims

1. A floor nozzle of a vacuum cleaner comprising:
 - an upper nozzle housing (12) adapted to be hingedly connected to an intake joint (15) of said cleaner;
 - a lower nozzle housing (13) securely connected to said upper nozzle housing (12) and defining an intake opening (18) on its lower side, said upper and lower nozzle housings (12, 13) defining therein a first air passage (36) communicating between said intake opening (18) and said intake joint (15);
 - a dust collector (30) accommodated in said nozzle housings (12, 13) and defining therein a second air passage (39) communicating said first air passage (36);
 - a thread catcher (31, 33, 35) accommodated in said dust collector (30) so as to be rotatable in response to forward and rearward movement of said floor nozzle, said thread catcher (31, 33, 35) being capable of catch waste thread on a surface to be cleaned when said thread catcher (31, 33, 35) rotates upon forward movement of said floor nozzle;
 - a scraper (32) accommodated in said dust collector (30) for removing the waste thread caught by said thread catcher (31, 33, 35) when said thread catcher (31, 33, 35) rotates upon rearward movement of said floor nozzle; and
 - a covering member (38) hingedly connect-

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ed to said dust collector (30) for opening or closing said second air passage (39).

2. The floor nozzle according to claim 1 further comprising a pair of rollers (17) disposed on respective sides of a connecting portion between said intake joint (15) and said upper nozzle housing (12) wherein said dust collector (30) is located between said rollers (17).
3. The floor nozzle according to claim 2, wherein a lowest portion of said thread catcher (31, 33, 35) is located higher than that of said rollers (17).
4. The floor nozzle according to claim 1, wherein each of said thread catcher (31, 33, 35) and said scraper (32) is provided on its surface with a great number of short bristles (33, 34).
5. The floor nozzle according to claim 1, wherein said thread catcher (31, 33, 35) comprises a rotor (31) provided with a circular external surface and a great number of bristles (33) provided on a portion of said external surface.
6. The floor nozzle according to claim 5, wherein said rotor (31) is further provided with an elastic member (35) on its external surface.
7. The floor nozzle according to claim 6, wherein said bristles (33) are provided on an external surface of said rotor (31) behind said elastic member (35).
8. The floor nozzle according to claim 6, wherein said circular external surface of said rotor (31) located behind said elastic member (35) is larger in radius than that of said rotor (31) located in front of said elastic member (35).
9. The floor nozzle according to claim 7, wherein said circular external surface of said rotor (31) located behind said elastic member (35) is larger in radius than that of said rotor (31) located in front of said elastic member (35).
10. The floor nozzle according to claim 5, wherein said bristles (33) of said rotor (31) are so directed as to rake up the surface to be cleaned upon rearward movement of said floor nozzle.
11. The floor nozzle according to claim 5, further comprising an elastic stopper (46) securely connected to an internal surface of said dust collector (30) for preventing said rotor (31) from rotating when said bristles (33) of said

rotor (31) confront the surface to be cleaned.

12. The floor nozzle according to claim 1, wherein said scraper (32) is movably mounted in said floor nozzle and biased towards said thread catcher (31, 33, 35).
13. The floor nozzle according to claim 1, wherein said covering plate (38) is located at a junction between said first and second air passages (36, 39) and hingedly connected at its front end.
14. The floor nozzle according to claim 1, wherein said thread catcher (31, 33, 35) is detachably mounted in said floor nozzle.
15. The floor nozzle according to claim 1, wherein said covering plate (38), said thread catcher (31, 33, 35) and said scraper (32) are mounted on or in said dust collector (30) having therein said second air passage (39) so that these members (30, 31, 32, 33, 35, 38) may be formed into one unit.
16. A floor nozzle of a vacuum cleaner comprising:
 - an upper nozzle housing (12) adapted to be hingedly connected to an intake joint (15) of said cleaner;
 - a lower nozzle housing (13) securely connected to said upper nozzle housing (12) and defining an intake opening (18) on its lower side, said upper and lower nozzle housings (12, 13) defining therein a first air passage (36) communicating between said intake opening (18) and said intake joint (15);
 - a dust collector (30) accommodated in said nozzle housings (12, 13) and defining therein a second air passage (39) communicating said first air passage (36);
 - a thread catcher (31, 33, 35) accommodated in said dust collector (30) so as to be rotatable in response to forward and rearward movement of said floor nozzle, said thread catcher (31, 33, 35) being capable of catch waste thread on a surface to be cleaned when said thread catcher (31, 33, 35) rotates upon forward movement of said floor nozzle;
 - a scraper (32) accommodated in said dust collector (30) for removing the waste thread caught by said thread catcher (31, 33, 35) when said thread catcher (31, 33, 35) rotates upon rearward movement of said floor nozzle;
 - a covering member (38) hingedly connected to said dust collector (30) for opening or closing said second air passage (39);
 - a pair of brushes (22) provided in parallel with said intake opening (18) so as to be

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capable of protruding from or retracting inside a lower portion of said floor nozzle; and

a driving mechanism (23, 28, 41, 42, 43) for driving said brushes (22), said covering member (38) being driven in association with said driving mechanism (23, 28, 41, 42, 43).

17. The floor nozzle according to claim 16, wherein said covering member (38) opens said second air passage (39) when said brushes (22) are held inside said floor nozzle.

Patentansprüche

1. Bodendüse eines Staubsaugers, welche aufweist:

ein oberes Düsengehäuse (12), welches für eine schwenkbare Verbindung mit einer Einlaßverbindung (15) des Staubsaugers eingerichtet ist;

ein unteres Düsengehäuse (13), welches fest mit dem oberen Düsengehäuse (12) verbunden ist und an seiner Unterseite eine Einlaßöffnung (18) definiert, wobei das obere und das untere Düsengehäuse (12, 13) darin einen ersten Luftweg (36) definieren, der die Einlaßöffnung (18) und die Einlaßverbindung miteinander verbindet;

einen Staubsammler (30), der in den Düsengehäusen (12, 13) untergebracht ist und darin einen zweiten Luftweg (39) definiert, der mit dem ersten Luftweg (36) in Verbindung steht;

einen Fadenfänger (31, 33, 35), der in dem Staubsammler (30) so untergebracht ist, daß er als Reaktion auf eine Vorwärts- und Rückwärtsbewegung der Bodendüse drehbar ist, wobei der Fadenfänger (31, 33, 35) befähigt ist, Staub- bzw. Abfallfäden auf einer zu reinigenden Fläche einzufangen, wenn sich der Fadenfänger (31, 33, 35) bei Vorwärtsbewegung der Bodendüse dreht;

ein Schrubberteile (32), welches in dem Staubsammler (30) untergebracht ist, um die vom Fadenfänger (31, 33, 35) eingefangenen Staub- bzw. Abfallfäden zu entfernen, wenn sich der Fadenfänger (31, 33, 35) bei Rückwärtsbewegung der Bodendüse dreht; und

ein mit dem Staubsammler (30) schwenkbar verbundenes Abdeckteil (38) zum Öffnen und Schließen des zweiten Luftwegs (39).

2. Bodendüse nach Anspruch 1, weiter aufweisend ein Rollenpaar (17), welches an den jeweiligen Seiten eines verbindenden Teils zwischen der Einlaßverbindung (15) und dem oberen Düsengehäuse (12) angebracht ist, wobei der Staubsammler (30) zwischen den Rollen (17) angeordnet ist.

3. Bodendüse nach Anspruch 2, wobei ein unterster Teil des Fadenfängers (31, 33, 35) höher angeordnet ist als die Rollen (17).

4. Bodendüse nach Anspruch 1, wobei der Fadenfänger (31, 33, 35) und das Schrubberteile (32) jeweils an ihrer Oberfläche mit einer großen Zahl Borsten (33, 34) versehen sind.

5. Bodendüse nach Anspruch 1, wobei der Fadenfänger (31, 33, 35) einen Rotor (31) aufweist, der mit einer kreisförmigen äußeren Oberfläche und einer großen Zahl Borsten (33) versehen ist, die an einem Teil der äußeren Oberfläche angebracht sind.

6. Bodendüse nach Anspruch 5, wobei der Rotor (31) außerdem mit einem elastischen Teil (35) an seiner äußeren Oberfläche versehen ist.

7. Bodendüse nach Anspruch 6, wobei die Borsten (33) an einer äußeren Oberfläche des Rotors (31) hinter dem elastischen Teil (35) angeordnet sind.

8. Bodendüse nach Anspruch 6, wobei die hinter dem elastischen Teil (35) angeordnete kreisförmige Oberfläche des Rotors (31) in ihrem Radius größer ist als derjenige des Rotors (31), der vor dem elastischen Teil (35) angeordnet ist.

9. Bodendüse nach Anspruch 7, wobei die hinter dem elastischen Teil (35) angeordnete kreisförmige Oberfläche des Rotors (31) in ihrem Radius größer ist als derjenige des Rotors (31), der vor dem elastischen Teil (35) angeordnet ist.

10. Bodendüse nach Anspruch 5, wobei die Borsten (33) des Rotors (31) so gerichtet sind, daß sie bei einer Rückwärtsbewegung der Bodendüse auf der zu reinigenden Fläche kratzen.

11. Bodendüse nach Anspruch 5, weiter aufweisend einen elastischen Anschlag (46), der fest mit einer inneren Oberfläche des Staubsammlers (30) verbunden ist, um zu verhindern, daß sich der Rotor (31) dreht, wenn die Borsten (33) des Rotors (31) der zu reinigenden Fläche gegenüberstehen.

12. Bodendüse nach Anspruch 1, wobei das Schrubberteile (32) beweglich in der Bodendüse eingebaut ist und gegen den Fadenfänger (31, 33, 35) vorbelastet ist.

13. Bodendüse nach Anspruch 1, wobei die Ab-

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deckplatte (38) an einer Verbindung zwischen dem ersten und zweiten Luftweg (36, 39) angeordnet und an ihrer Vorderseite schwenkbar verbunden ist.

14. Bodendüse nach Anspruch 1, wobei der Fadenfänger (31, 33, 35) in der Bodendüse abnehmbar angebracht ist.

15. Bodendüse nach Anspruch 1, wobei die Abdeckplatte (38), der Fadenfänger (31, 33, 35) und das Schrubberteil (32) auf oder in dem Staubsammler (30) angebracht sind, der darin den zweiten Luftweg (39) aufweist, so daß diese Teile (30, 31, 32, 33, 35, 38) als eine Einheit ausgebildet werden können.

16. Bodendüse eines Staubsaugers, welche aufweist:

ein oberes Düsengehäuse (12), welches für eine schwenkbare Verbindung mit einer Einlaßverbindung (15) des Staubsaugers eingerichtet ist;

ein unteres Düsengehäuse (13), welches fest mit dem oberen Düsengehäuse (12) verbunden ist und an seiner Unterseite eine Einlaßöffnung (18) definiert, wobei das obere und das untere Düsengehäuse (12, 13) darin einen ersten Luftweg (36) definieren, der die Einlaßöffnung (18) und die Einlaßverbindung miteinander verbindet;

einen Staubsammler (30), der in den Düsengehäusen (12, 13) untergebracht ist und darin einen zweiten Luftweg (39) definiert, der mit dem ersten Luftweg (36) in Verbindung steht;

einen Fadenfänger (31, 33, 35), der in dem Staubsammler (30) so untergebracht ist, daß er als Reaktion auf eine Vorwärts- und Rückwärtsbewegung der Bodendüse drehbar ist, wobei der Fadenfänger (31, 33, 35) befähigt ist, Staub- bzw. Abfallfäden auf einer zu reinigenden Fläche einzufangen, wenn sich der Fadenfänger (31, 33, 35) bei Vorwärtsbewegung der Bodendüse dreht;

ein Schrubberteil (32), welches in dem Staubsammler (30) untergebracht ist, um die vom Fadenfänger (31, 33, 35) eingefangenen Staub- bzw. Abfallfäden zu entfernen, wenn sich der Fadenfänger (31, 33, 35) bei Rückwärtsbewegung der Bodendüse dreht;

ein mit dem Staubsammler (30) schwenkbar verbundenes Abdeckteil (38) zum Öffnen und Schließen des zweiten Luftwegs (39),

ein Bürstenpaar (22), welches parallel zur Einlaßöffnung (18) angeordnet ist, so daß es in der Lage ist, von einem unteren Teil der Bodendüse abzustehen oder darin eingezogen zu werden; und

einen Antriebsmechanismus (23, 28, 41, 42, 43) zum Antreiben der Bürsten (22), wobei das Abdeckteil (38) im Zusammenhang mit dem Antriebsmechanismus (23, 28, 41, 42, 43) angetrieben wird.

17. Bodendüse nach Anspruch 16, wobei das Abdeckteil (38) den zweiten Luftweg (39) öffnet, wenn die Bürsten (22) innerhalb der Bodendüse gehalten sind.

Revendications

1. Suceur de sol d'un aspirateur comprenant :
un boîtier de suceur supérieur (12) conçu pour être connecté au moyen de charnières à une pièce de jonction d'aspiration (15) dudit aspirateur ;

un boîtier de suceur inférieur (13) connecté fermement audit boîtier de suceur supérieur (12) et définissant une ouverture d'aspiration (18) sur son côté inférieur, lesdits boîtiers de suceur supérieur et inférieur (12, 13) définissant en eux un premier passage d'air (36) qui assure la communication entre ladite ouverture d'aspiration (18) et ladite pièce de jonction d'aspiration (15) ;

un collecteur de poussière (30) adapté dans lesdits boîtiers de suceur (12, 13) et définissant à l'intérieur un second passage d'air (39) qui communique avec ledit premier passage d'air (36) ;

un piègeur de fils (31, 33, 35) adapté dans ledit collecteur de poussière (30) de manière à pouvoir être mis en rotation en réponse à un déplacement vers l'avant et vers l'arrière dudit suceur de sol, ledit piègeur de fils (31, 33, 35) pouvant piéger des déchets de fil sur une surface qui doit être nettoyée lorsque ledit piègeur de fils (31, 33, 35) tourne suite à un déplacement vers l'avant dudit suceur de sol ;

un racleur (32) adapté dans ledit collecteur de poussière (30) pour ôter les déchets de fil piégés par ledit piègeur de fils (31, 33, 35) lorsque ledit piègeur de fils (31, 33, 35) tourne suite à un déplacement vers l'arrière dudit suceur de sol ; et

un élément de recouvrement (38) connecté au moyen de charnières audit collecteur de poussière (30) pour ouvrir ou fermer ledit second passage d'air (39).

2. Suceur de sol selon la revendication 1, comprenant en outre une paire de galets (17) disposés sur des côtés respectifs d'une partie de connexion située entre ladite pièce de jonction d'aspiration (15) et ledit boîtier de suceur supérieur (12), ledit collecteur de poussière (30)

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étant positionné entre lesdits galets (17).

3. Suceur de sol selon la revendication 2, dans lequel une partie inférieure dudit piéteur de fils (31, 33, 35) est située plus haut que celle desdits galets (17). 5
4. Suceur de sol selon la revendication 1, dans lequel ledit piéteur de fils (31, 33, 35) et ledit racleur (32) sont chacun munis sur leur surface d'un nombre important de poils de brosse 10 courts (33, 34).
5. Suceur de sol selon la revendication 1, dans lequel ledit piéteur de fils (31, 33, 35) comprend un rotor (31) muni d'une surface externe circulaire, un nombre important de poils de brosse 15 (33) étant prévus sur une partie de ladite surface externe.
6. Suceur de sol selon la revendication 5, dans lequel ledit rotor (31) est en outre muni d'un élément élastique (35) sur sa surface externe. 20
7. Suceur de sol selon la revendication 6, dans lequel lesdits poils de brosse (33) sont prévus sur une surface externe dudit rotor (31), derrière ledit élément élastique (35). 25
8. Suceur de sol selon la revendication 6, dans lequel ladite surface externe circulaire dudit rotor (31) située derrière ledit élément élastique (35) présente un rayon plus grand que celui dudit rotor (31) situé à l'avant dudit élément élastique (35). 30 35
9. Suceur de sol selon la revendication 7, dans lequel ladite surface externe circulaire dudit rotor (31) située derrière ledit élément élastique (35) présente un rayon plus grand que celui dudit rotor (31) situé à l'avant dudit élément élastique (35). 40
10. Suceur de sol selon la revendication 5, dans lequel lesdits poils de brosse (33) dudit rotor (31) sont dirigés de manière à racleur la surface qui doit être nettoyée suite à un déplacement vers l'arrière dudit suceur de sol. 45
11. Suceur de sol selon la revendication 5, comprenant en outre une butée élastique (46) connectée fermement à une surface interne dudit collecteur de poussière (30) pour empêcher la rotation dudit rotor (31) lorsque lesdits poils de brosse (33) dudit rotor (31) font face à la surface qui doit être nettoyée. 50 55
12. Suceur de sol selon la revendication 1, dans

lequel ledit racleur (32) est monté de façon mobile dans ledit suceur de sol et est poussé en direction dudit piéteur de fils (31, 33, 35).

13. Suceur de sol selon la revendication 1, dans lequel ladite plaque de recouvrement (38) est placée au niveau d'une jonction entre lesdits premier et second passages d'air (36, 39) et est connectée au moyen de charnières au niveau de son extrémité avant. 10
14. Suceur de sol selon la revendication 1, dans lequel ledit piéteur de fils (31, 33, 35) est monté de manière amovible dans ledit suceur de sol. 15
15. Suceur de sol selon la revendication 1, dans lequel ladite plaque de recouvrement (38), ledit piéteur de fils (31, 33, 35) et ledit racleur (32) sont montés sur ou dans ledit collecteur de poussière (30) qui inclut en son sein ledit second passage d'air (39) de telle sorte que ces éléments (30, 31, 32, 33, 35, 38) puissent être formés en tant qu'unité. 20
16. Suceur de sol d'un aspirateur comprenant :
 - un boîtier de suceur supérieur (12) conçu pour être connecté au moyen de charnières à une pièce de jonction d'aspiration (15) dudit aspirateur ;
 - un boîtier de suceur inférieur (13) connecté fermement audit boîtier de suceur supérieur (12) et définissant une ouverture d'aspiration (18) sur son côté inférieur, lesdits boîtiers de suceur supérieur et inférieur (12, 13) définissant en eux un premier passage d'air (36) qui assure la communication entre ladite ouverture d'aspiration (18) et ladite pièce de jonction d'aspiration (15) ;
 - un collecteur de poussière (30) adapté dans lesdits boîtiers de suceur (12, 13) et définissant à l'intérieur un second passage d'air (39) qui communique avec ledit premier passage d'air (36) ;
 - un piéteur de fils (31, 33, 35) adapté dans ledit collecteur de poussière (30) de manière à pouvoir être mis en rotation en réponse à un déplacement vers l'avant et vers l'arrière dudit suceur de sol, ledit piéteur de fils (31, 33, 35) pouvant piéger des déchets de fil sur une surface qui doit être nettoyée lorsque ledit piéteur de fils (31, 33, 35) tourne suite à un déplacement vers l'avant dudit suceur de sol ;
 - un racleur (32) adapté dans ledit collecteur de poussière (30) pour ôter les déchets de fil piégés par ledit piéteur de fils (31, 33, 35) lorsque ledit piéteur de fils (31, 33, 35) tourne suite à un déplacement vers l'arrière dudit

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suceur de sol ;

un élément de recouvrement (38) connecté
au moyen de charnières audit collecteur de
poussière (30) pour ouvrir ou fermer ledit se-
cond passage d'air (39) ;

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une paire de brosses (22) qui sont prévues
parallèlement à ladite ouverture d'aspiration
(18) de manière à pouvoir se projeter depuis
une partie inférieure dudit suceur de sol ou à
pouvoir se rétracter à l'intérieur de cette partie
; et

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un mécanisme d'entraînement (23, 28, 41,
42, 43) pour entraîner lesdites brosses (22),
ledit élément de recouvrement (38) étant en-
traîné en association avec ledit mécanisme
d'entraînement (23, 28, 41, 42, 43).

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17. Suceur de sol selon la revendication 16, dans
lequel ledit élément de recouvrement (38) ou-
vre ledit second passage d'air (39) lorsque
lesdites brosses (22) sont maintenues à l'inté-
rieur dudit suceur de sol.

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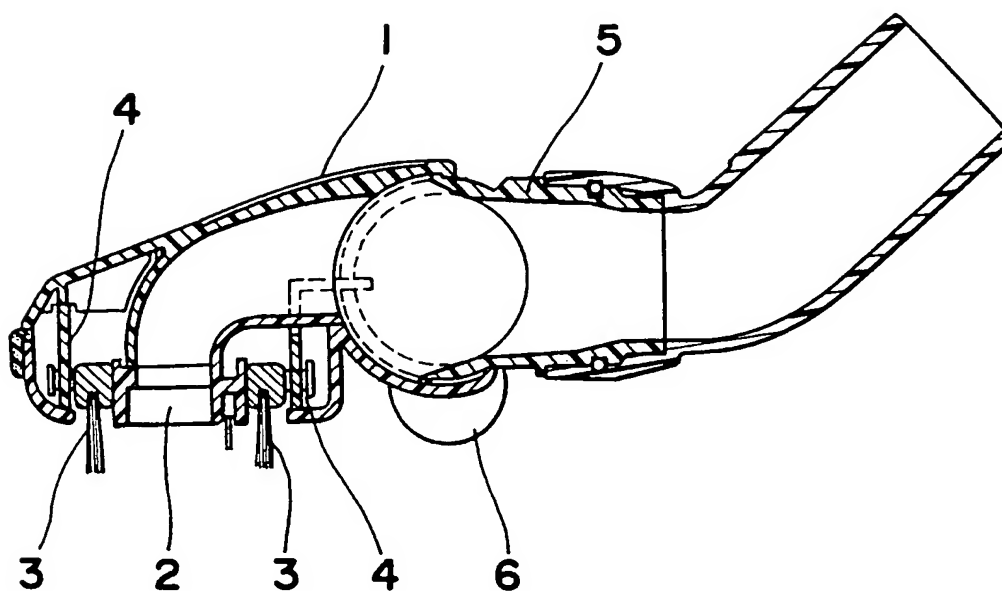
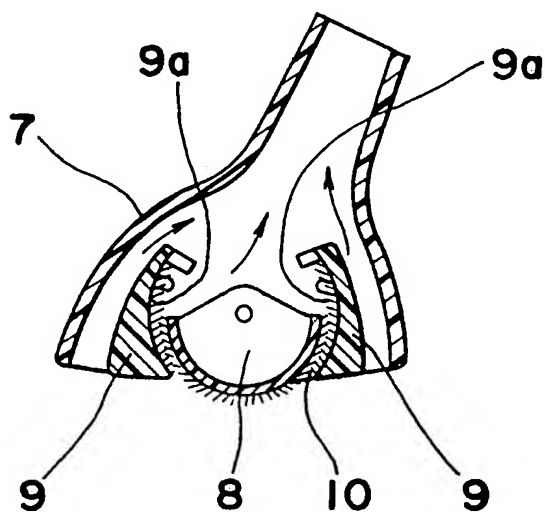
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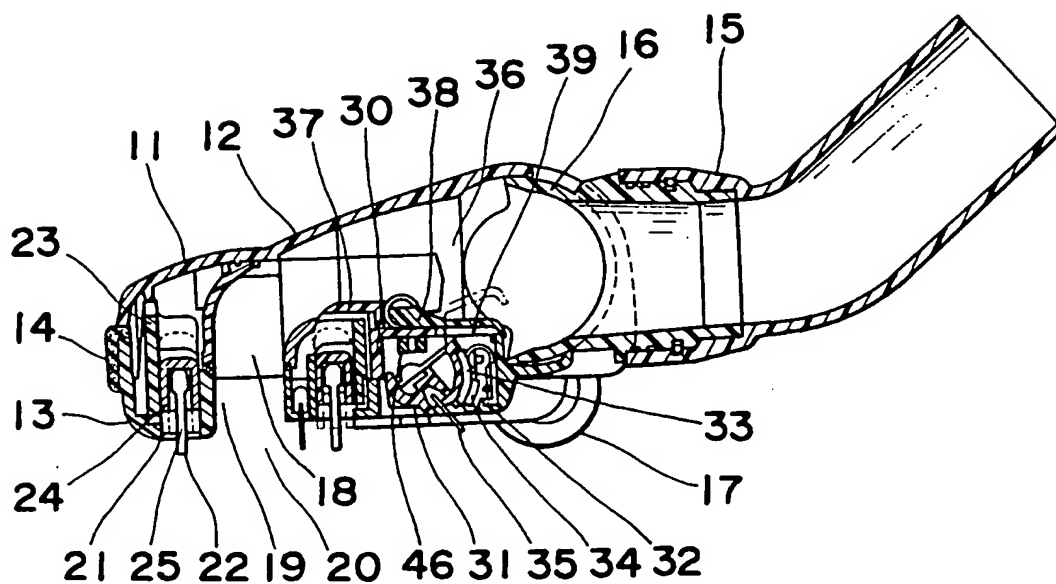
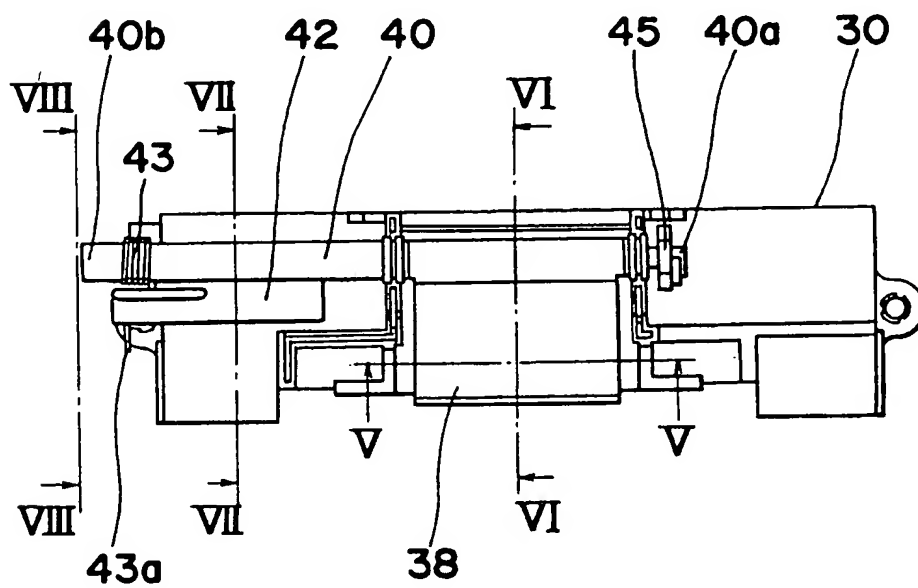
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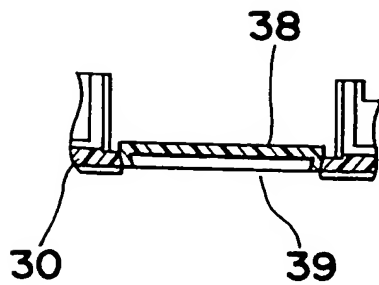
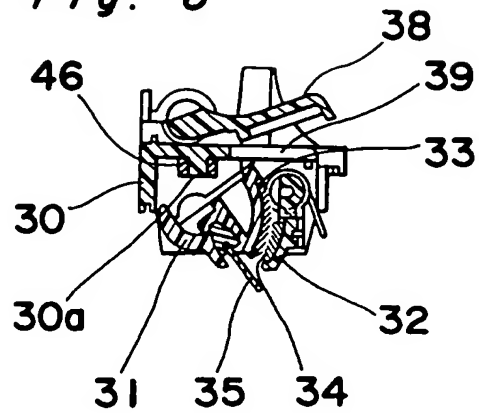
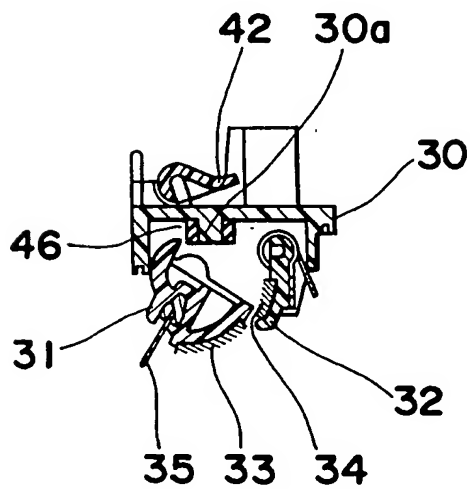
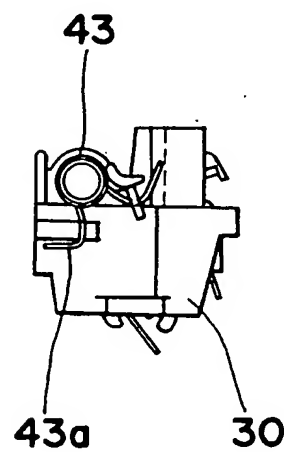
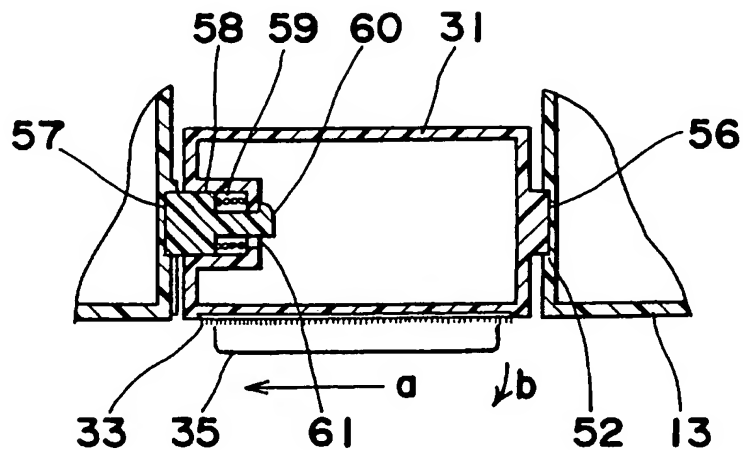
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Fig. 1 PRIOR ART*Fig. 2 PRIOR ART*

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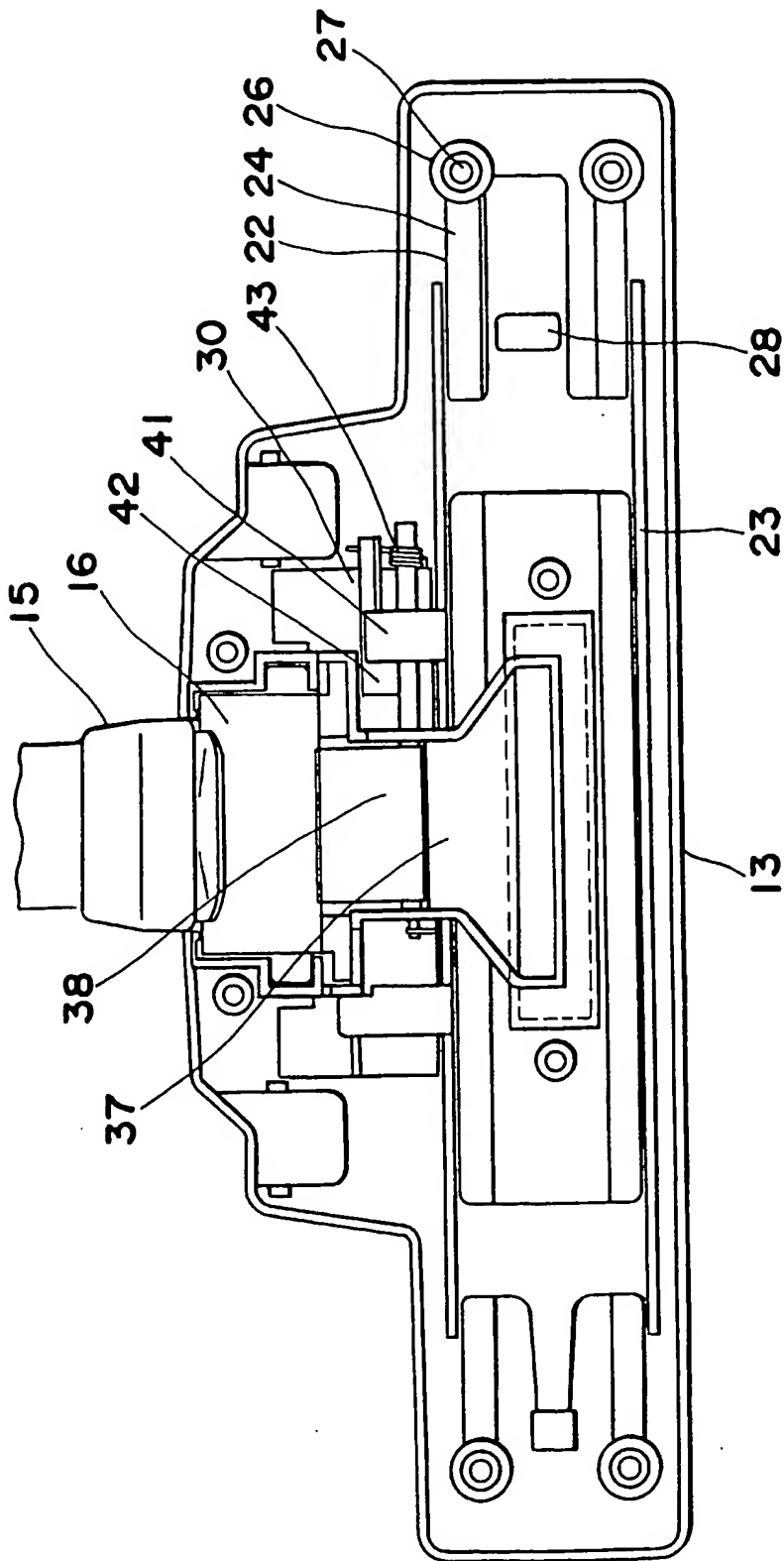
Fig. 3*Fig. 4*

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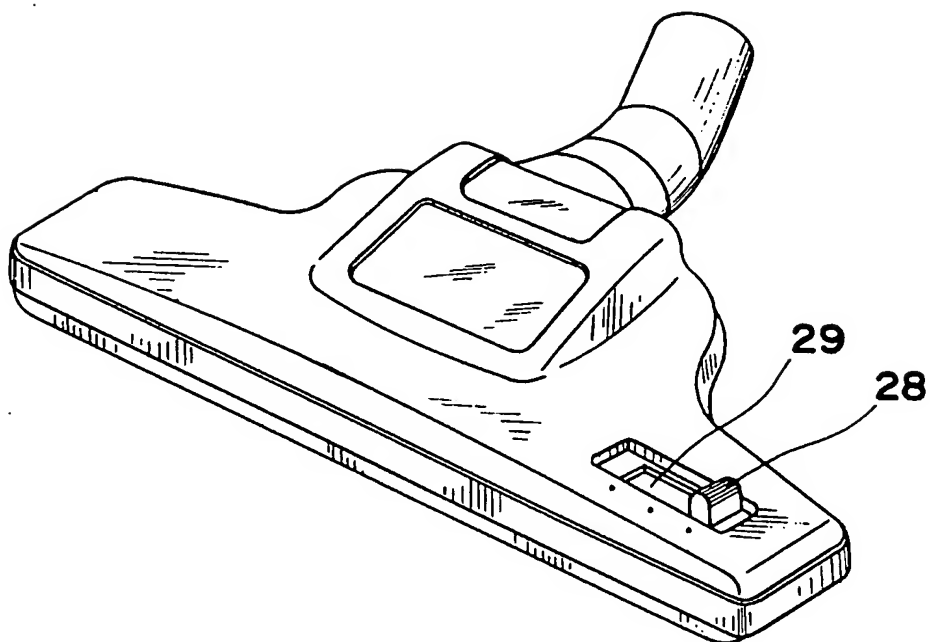
Fig. 5*Fig. 6**Fig. 7**Fig. 8**Fig. 12*

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Fig. 9



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Fig. 10*Fig. 11*